SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-42

Name: Twin Lakes **County**: Minnehaha
Legal Description: T105N-R52W Sec. 16-17, 20-21
Location from nearest town: 6 miles north and 1 mile west of Humboldt, SD

Dates of present survey: June 16-17, 2009
Dates of last survey: August 7-9, 2007

Primary Game and Forage Species	Other Species
Walleye	Black Bullhead
Yellow Perch	

PHYSICAL DATA

Surface Area: 287 acres **Watershed area**: Unknown acres
Maximum depth: 20 feet **Mean depth**: 9 feet
Contour map available: No **Date mapped**: 2003 (shoreline only)
Lake elevation observed during the survey: Full
Ownership of Lake and Adjacent Lakeshore Properties

Twin Lakes is not listed as meandered public water in the State of South Dakota Listing of Meandered Lakes; however, the fishery is managed by the South Dakota Department of Game, Fish and Parks (GFP). GFP also owns and manages a 254 acre Game Production Area which includes much of the lakes. The remainder of the shoreline is privately owned.

Fishing Access:

The Twin Lakes Fishing Access Area, located on the west side of the south lake, features a boat ramp, dock, toilet and parking for about 15 vehicle-trailer rigs. There are also several areas to shore fish located east of the boat ramp. A project to dig a canal for connecting the north and south lakes has been approved and construction is planned for fall 2010.

Field Observations of Water Quality and Aquatic Vegetation:

The Secchi reading was 4.7 m (15.6 ft) on the north lake. The water was more turbid on the shallower south lake, as usual, with a reading of only 3.7 m (12 ft). Abundant beds of sago pondweed (*Potamogeton pectinatus*), clasping leaf pondweed (*Potamogeton richardsonii*), northern water milfoil (*Myriophyllum exalbescens*), water buttercup (*Ranunculus longirostris*), and coontail (*Ceratophyllum demersum*) were observed in water up to 1.82 m (6 ft) deep. Common cattail (*Typha spp.*) and bulrush (*Scirpus spp.*) were abundant in shallow areas.

BIOLOGICAL DATA

Methods:

Twin Lakes was sampled on June 16-17, 2009, with three overnight gill-net sets and 5 overnight trap-net sets on each lake. The trap nets are constructed with 19-mm-bar-mesh (3/4 in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh (½, ¾, 1, 1¼, 1½, and 2 in) monofilament netting.

Results and Discussion:

Gill Net Catch

Walleye, black bullheads and yellow perch were the only species sampled in the gill nets this year on both lakes (Tables 1 and 2).

Table 1. Total catch from three overnight gill net sets at South Twin Lakes, Minnehaha County, August 7-9, 2009.

Species	Number	Percent	CPUE[1]	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	77	66.4	25.7	±7.6	66.3	53	13	102
Walleye	37	31.9	12.3	±3.6	47.7	84	6	102
Yellow Perch	2	1.7	0.7	±1.9	10.8	--	--	--

* 3 years (2004, 2006, 2007)

Table 2. Total catch from three overnight gill net sets at North Twin Lakes, Minnehaha County, August 7-9, 2009.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Walleye	64	52.0	21.3	±6.9	37.0	83	2	92
Black Bullhead	55	44.7	18.3	±13.4	89.4	96	31	113
Yellow Perch	4	3.3	1.3	±1.1	4.0	--	--	--

*2 years (2006, 2007)

[1] See Appendix A for definitions of CPUE, PSD, RSD-P, and mean Wr.

Trap Net Catch

Black bullheads made up 84.6% of the trap net sample on the South Lake (Table 3) and 82.7% on the North (Table 4). Walleye and yellow perch were the only other fish caught.

Table 3. Total catch from five overnight trap net sets at South Twin Lakes, Minnehaha County, August 7-9, 2009.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	165	84.6	33.0	±13.4	329.3	68	12	109
Yellow Perch	18	9.2	3.6	±1.8	2.2	100	22	96
Walleye	12	6.2	2.4	±2.1	4.8	--	--	--

* 3 years (2004, 2006, 2007)

Table 4. Total catch from five overnight trap net sets at North Twin Lakes, Minnehaha County, August 7-9, 2009.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	67	82.7	13.4	±5.6	215.1	95	41	116
Walleye	14	17.3	2.8	±1.8	18.2	--	--	--

* 2 years (2006, 2007)

Walleye

Management objective: Maintain a walleye population with a gill-net CPUE of at least 15, a PSD range of 30-60, and a growth rate of 356 mm (14 inches) by age-3.

Walleye gill-net CPUE and growth exceeded management objectives in 2009 (Tables 1, 2, and 5). Several strong year classes were present due to an aggressive stocking strategy and the protective length limit. We predict that RSD-P will increase as the strong age-3 year class grows past 51 cm (20 in) (Figure 1). The fish sampled in gill nets were in good condition with mean relative weights (Wr) between 90 and 100, which is high for midsummer. Large numbers of fathead minnows were seen in the vegetation in both lakes during the survey.

Table 5. Weighted mean length at capture (mm) for walleye captured in gill nets in North and South Twin Lakes Minnehaha County, 2006, 2007, and 2009. Note: sampling was conducted at approximately the same time during each year allowing comparisons among years to monitor growth trends. Sample size in parentheses.

Year	1	2	3	4	5	6	7	8	9	10	11	12
2009	244	381	418	463	500	--	--	--	--	--	--	--
(101)	(28)	(1)	(46)	(19)	(7)							
2007	297	363	416	472	499	523	538	558	--	670	--	--
(190)	(100)	(51)	(20)	(10)	(3)	(2)	(2)	(1)		(1)		
2006	267	408	444	--	491	547	--	--	--	--	--	--
(71)	(104)	(34)	(9)		(2)	(3)						

Black Bullhead

Management objective: Maintain a black bullhead population with a trap-net CPUE of 100 or less.

Black bullhead trap net CPUE currently meets the management objective (Tables 6 and 7). In 2003, we began a five year research study to evaluate the use of walleye predation as a biological control of black bullheads. The average length of bullheads in the 2006 sample was 156 mm (6.1 in) compared to 230 mm (9.1 in) in 2007, and 261 mm (10.3 in) in 2009. The continuing decline in CPUE and the increasing size of bullheads (shown in Figure 2) is a clear illustration that the protective walleye regulation is accomplishing the objective of controlling the bullhead population.

Table 6. Black bullhead trap net CPUE, PSD, RSD-P, and mean Wr for South Twin Lake, Minnehaha County, 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CPUE					250.6		651.6	85.8		33.0
PSD					76		19	9		68
RSD-P					6		13	1		12
Mean Wr					98		98	89		109

Table 7. Black bullhead trap net CPUE, PSD, RSD-P, and mean Wr for North Twin Lake, Minnehaha County, 2000-2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CPUE							377.0	53.2		13.4
PSD							3	57		95
RSD-P							3	0		41
Mean Wr							128	88		116

MANAGEMENT RECOMMENDATIONS

1. Conduct annual (biennial) lake surveys to monitor the fishery.

2. Stock walleyes and yellow perch as needed to maintain the populations.

Table 8. Stocking record for Twin Lakes, Minnehaha County, 1995-2009.

Year	Number	Species	Size
1995	32	Walleye	Adult
1996	500	Yellow Perch	Adult
2000	1,920	Yellow Perch	Adult
2002	109	Walleye	Adult
2003	58,784	Walleye	Fingerling
2004	5,606	Walleye	Large Fingerling
	25	Walleye	Juvenile
2005	19,616	Walleye	Large Fingerling
2006	31,030	Walleye	Fingerling
	5,372	Yellow Perch	Adult
2007	1,493	Yellow Perch	Adult
2008	29,300	Walleye	Fingerling
	3,980	Yellow Perch	Adult

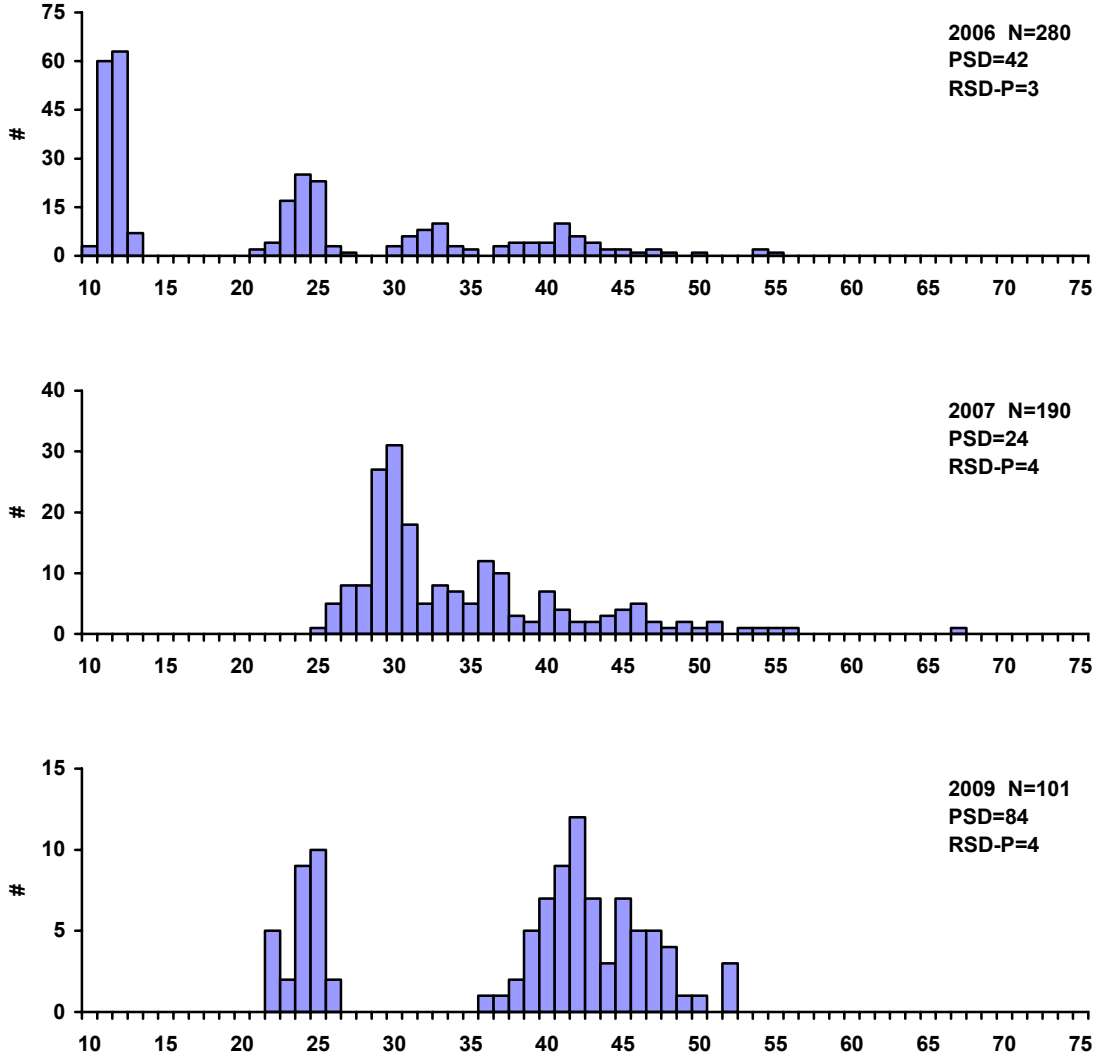

Figure 1. Length frequency histograms for walleye sampled with gill nets in Twin Lakes, Minnehaha County, 2006, 2007 and 2009.

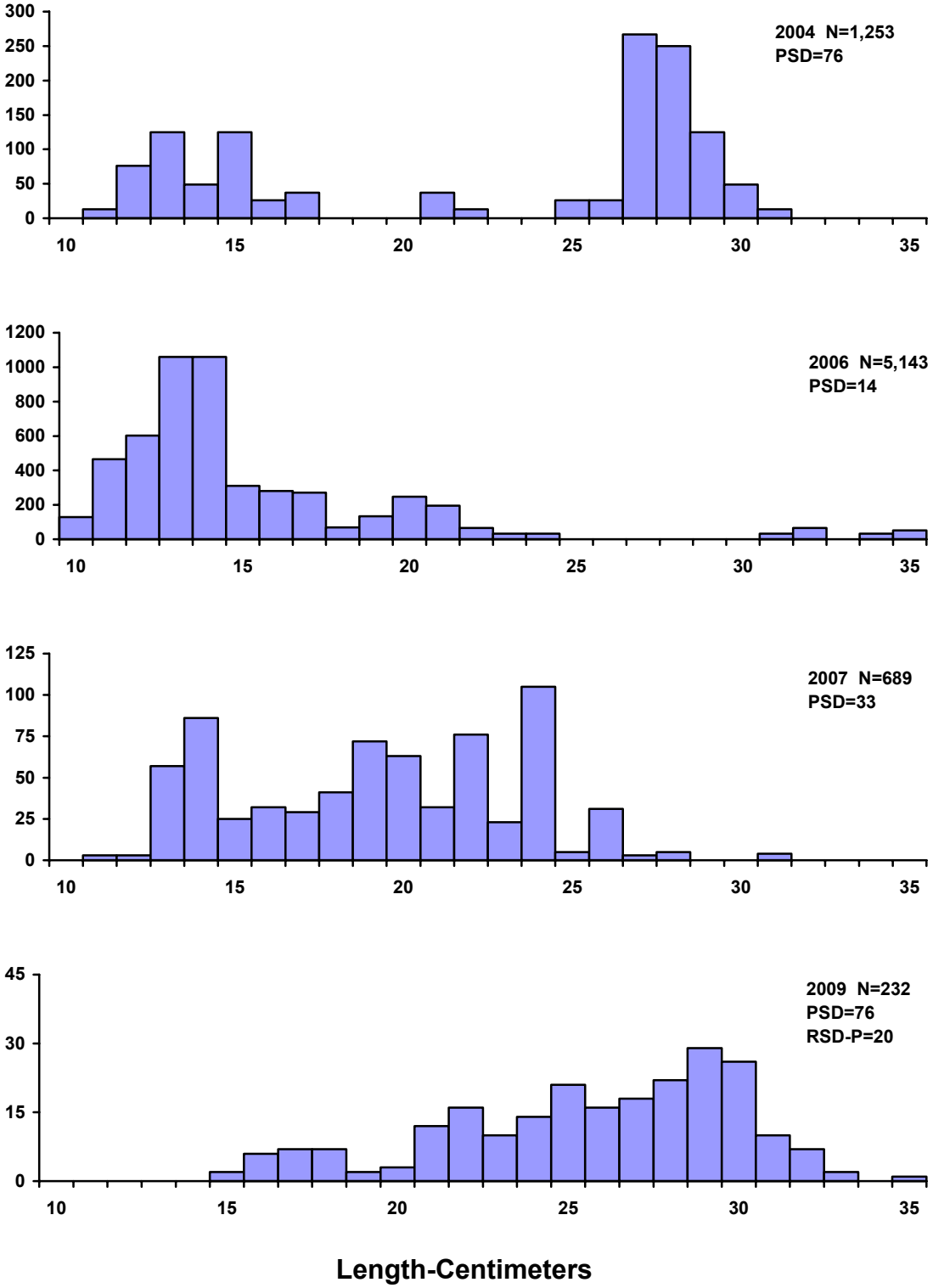

Figure 2. Length frequency histograms for black bullheads sampled with trap nets in Twin Lakes, Minnehaha County, 2004, 2006, 2007, and 2009.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.